THE STRATIOMYIDAE OF CEDAR POINT, SANDUSKY.

(Order Diptera)

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A shallow, weedy body of quiet water with a low muddy or sandy shore, is the ideal breeding place for most Stratiomyidae. These conditions are found at Cedar Point. The shore of Sandusky Bay along the point is low and sandy and in most places covered with a layer of mud and debris washed up by the waves. Along the shore there are many patches of swamp land. At the eastern end of the bay there is a swamp covering several square miles, through which run many winding flood channels; the largest of these is called Black Channel. The bottom of the bay has a thick deposit of mud and supports a luxuriant growth of submerged plants, while on the surface in many places are thick mats of algae and floating plants. All these conditions are favorable and most of the species found were very common. Since no collecting has been done at Cedar Point before the middle of June, it is probable that there are a number of early forms which have not been taken.

The family Stratiomyidae is a rather large one, having about one thousand described species, of which about two hundred are found in North America. They are bare or thinly pilose flies with flattened abdomen and often having bright yellow or green markings which give them the name of Soldier Flies. The squamae are small or vestigial, tibiae without spurs and the antennae are three-jointed, the third joint being composed of several annulations and often bearing a terminal arista. The wings are clear or smoky and are held along the abdomen when at rest. Species of this family may be easily recognized by the venation of the wing; the longitudinal veins being more or less crowded along the costal margin, while the posterior veins are often weak or vestigial. The discal cell is usually small and oval or irregularly six-sided.

C. A. Hart in his "Entomology of the Illinois River" has given many interesting observations on the habits of Stratiomyidae. He found the females of Odontomyia cincta and O. vertebrata ovipositing on reeds, stakes and dead branches in the water. The larvae of Stratiomyia and Odontomyia are elongate and flattened, rather large, and of an opaque greenish, brown, or gray color obscurely striped. The former prefer the low shores and are found crawling over the mud or living in the plant debris, while the latter live in the water. The pupa is formed in one end of the larval skin, which becomes inflated and floats on the water. The imago emerges through a median slit connecting transverse slits in the second and fourth segments.

The adults are found about flowers or resting on plants near the water, and may be collected by sweeping with the net. The flowers of milkweed (*Asclepias*) are very attractive to many kinds of flies including Stratiomyidae, Syrphidae, Tabanidae, Muscidae, Tachinidae, Sarcophagidae, Dexidae and Conopidae. Two species of milkweeds are found at Cedar Point, *Asclepias syriaca* L. and *A. incarnata* L. Along the point in the vicinity of Black Channel there is an abundant growth of the former, and at times the clusters of flowers are nearly covered with flies and many more are buzzing around them. The flowers of this genus have a remarkable adaptation for cross pollination by insects. As the insect crawls over the flower its claws catch in V-shaped fissures between the nectariferous hoods and are guided along a slit to a notched disk which clings to the foot. To this disk are fastened two flat, spatulate pollen masses or pollinia, which are pulled out by the insect and carried to other flowers. A few of the small bees and many of the flies are unable to pull out some of the pollinia and are thus entrapped. This facilitates matters for the collector, for they can then be picked off with the fingers and put into the cyanide bottle. Some of the specimens had as many as ten pairs of pollinia clinging to their feet. The species of Odontomyia are more often entrapped than Stratiomyia, which are larger. Those that are not entrapped may often be caught by clapping them into the bottle with the cork. The swamp milkweed (*A. incarnata* L.) is found at the waters edge or at the edge of the cat-tail zone. It is not so much frequented by Stratiomyidae as by other insects, and on many of the flower clusters there are one or two ambush bugs (*Phymata erosa* L.), which probably devour many of the entrapped flies.

The yellow pond lily (*Nymphaea advena* Ait.) is another flower on which a number of flies can be found. They must be approached carefully in a boat, for some of the larger flies will fly out if the water is much disturbed. On coming near enough one can slip the hand under the flower and close it up. The whole flower can then be broken off and put in the cyanide bottle for a short time, after which it should be removed and the flies sorted out. Other common plants which are very attractive to flies and other insects are the blue vervain (*Verbena hastata* L.), the swamp rose mallow (*Hibiscus Moschentos* L.) and the pickerel-weed (*Pontederia cordata* L.) Good collecting can be done by sweeping among the swamp grasses. At times the end of the net, with whatever it may contain, can be put in the cyanide bottle for about a minute and then removed and the desirable specimens taken out.

The following species have been taken:

Odontomyia—
- cincta Olivier.
- hydroleonoides Johnson.
- virgo Wied.
- vertebrata Say.
- nigerrima Loew.

Stratiomyia—
- badia Walker.
- lativentris Loew.
- meigenii Wied.
- normula Loew.
- discalis Loew.

Geosargus elegans Loew.
Pachygaster pulcher Loew.
Nothomyia viridis Hine.

The first three species of Odontomyia were very common both on land and water, while O. vertebrata and O. nigerrim seem to be rare, only one specimen of each having been taken. The species of Stratiomyia were found on land and were commonest in the vicinity of Black Channel.